INTRODUCTION

The blue crab (Callinectes sapidus) supports one of the most valuable commercial fisheries in North Carolina. Over the last twelve years, annual hard crab landings have averaged 32,796,759 pounds with a dock-side value of $7,321,650 (Table 1). Blue crabs are primarily exploited by pot and trawl fisheries in North Carolina. Crab pots currently account for over 95% of all blue crab landings. Overall, the crab trawl fishery contributes <5% of the total crab landings. Blue crab meat accounts for over 45% of the annual value of all processed fisheries products in North Carolina with an estimated value of over $27 million dollars (DMF data 1980-1989).

The Pamlico River estuary (including the Pamlico and Pungo rivers and their associated feeder streams) recently experienced a decline in blue crab production. The causative agents and the severity of the decline are unknown. However, public opinion has laid the majority of the blame on the crab trawl fishery. This opinion, coupled with the lack of fishery-dependent data for the crab trawl and pot fisheries, has put managers in a difficult position. Relatively little information is available to objectively manage blue crabs in North Carolina. A synopsis of information on the blue crab is contained in Appendix A. Prior studies collecting fishery-dependent data from the crab pot and trawl fisheries include a trawl exploitation study in the Neuse River by Fischler (1965), commercial sampling in western Pamlico Sound (Wolff 1978 and Ross and Carpenter 1980), and crab pot sampling in Core Sound (Dudley and Judy 1973 and DeVries 1981). In order to objectively manage this resource, up-to-date fishery-dependent data, such as size and sex composition of catches, number and weight of individuals in the catch, and effort data, were needed. Data collected during this study were used to: 1) develop management strategies to optimize yield in the blue crab trawl and pot fisheries and 2) establish baseline data against which future studies can be compared.

The objectives of this study were to examine: 1) harvest rates and bycatch in the crab pot and trawl fisheries; 2) the physical injury and immediate mortality of blue crabs in the pot and trawl fisheries; and 3) the level of delayed mortality of blue crabs in the pot and trawl fisheries.

MATERIALS AND METHODS

This study was conducted in the Pamlico River estuary. This area was selected because 1) declines in blue crab production and the perceived opinion that these declines were caused by crab trawling in the river, required the collection of fishery-dependent data from this system and 2) the utility of data obtained from this study, particularly objectives two and three, were applicable statewide.

Objective 1: **The quantification of harvest rates and bycatch in the crab trawl and pot fisheries**